

# CONTAINER ASSEMBLY HAVING AN OVERCAP WITH A STORAGE COMPARTMENT

## BACKGROUND OF THE INVENTION

### Field of the Invention

The present invention is related to overcaps for container assemblies, and more particularly, overcaps having a recessed storage compartment for storing of a product.

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### Description of Related Art

Convenience is a major factor in designing containers, such as cups, for holding consumable liquids, especially "travel" containers intended for easy transport without spillage of the liquid. To this end, such containers often have a lid, or overcap, affixed to the container so as to limit escape of the liquids due to changes in container orientation. Another problem with dispensing consumable liquids in containers is that the consumer often wishes to add various products to the liquid, such as sugar or powdered cream to coffee. However, such products are typically distributed in small, individual packages that are not easily located or opened to dispense their contents into the liquid.

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The container lid may be configured to store products that will be subsequently mixed with a liquid. U.S. Patent No. 3,326,363 to Bennett et al. ("Bennett") discloses a container lid with a plurality of integrally-formed, hollow pockets to hold products such as sugar, powdered cream, or soft-drink concentrate. A sealing member seals the product inside the pockets, and the sealing member may be easily torn or removed to provide access to the product. The Bennett patent, and similar lids with hollow pockets, do not provide an aperture for convenient access to the liquid or product within the container, thus requiring the consumer to remove the lid to gain access to the liquid.

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Containers for consumable liquids, particularly hot liquids, often include a sleeve to insulate against the heat from the hot liquid in the container. U.S. Patent No. 5,765,716 to Cai et al. discloses a lid integrally formed with a sleeve that insulates the wall of the container. The sleeve is tethered to the lid and is configured to slidably receive the container. Connection of the lid to the container may be difficult for

consumers because the container must first be inserted into the sleeve and then the tethered lid must be rotated to attach the lid to the open upper end.

A need exists for a container lid or overcap that provides convenient access to liquids and includes a storage compartment for a product to be mixed with the liquid. A  
5 need also exists for a lid that is easily attached to a container and that provides a grip surface that insulates against heat from a hot liquid.

#### BRIEF SUMMARY OF THE INVENTION

The invention addresses the above needs and achieves other advantages by  
10 providing an overcap for a container, wherein the overcap can store a product for mixing with a liquid held in the container. The overcap includes a rim configured to engage the container and a top wall that defines a storage compartment in an underside of the top wall. The top wall also includes a substantially horizontal annular portion radially inward of the rim and surrounding the storage compartment. The overcap also has a membrane  
15 removably attached to the underside of the top wall of the overcap covering the storage compartment for sealing a product in the storage compartment. The overcap may also be made of a multi-layer polymer material to provide oxygen and moisture protection. A drinking aperture is defined in the annular portion to provide convenient access to liquids that may be held in the container.

20 The overcap of further embodiments includes a skirt extending downwardly from the rim and includes a grip surface defined on the skirt. The skirt may include a plurality of spacers along an inner surface of the skirt, and the spacers may be circumferentially spaced apart from each other and extend downwardly from the rim of the overcap. The grip surface can be held by the consumer to support the container assembly when a hot  
25 liquid is held in the container. In addition, the spacers of the skirt insulate against heat from the hot liquid by spacing the skirt from the container wall.

Likewise, another embodiment of the present invention provides an overcap for a container, wherein the overcap includes a rim configured to engage the container and a top wall that defines a storage compartment in an underside of the top wall. The top wall  
30 also includes a substantially horizontal annular portion radially inward of the rim and surrounding the storage compartment. The overcap also has a membrane removably

attached to the underside of the top wall of the overcap covering the storage compartment for sealing a product contained in the storage compartment. A skirt extends downwardly from the rim and includes a grip surface defined on the skirt. The grip surface can be held by the consumer to support the container assembly when a hot liquid is held in the container and may insulate against heat from the hot liquid.

#### BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

Having thus described the invention in general terms, reference will now be made to the accompanying drawings, which are not necessarily drawn to scale, and wherein:

**FIG. 1** is a perspective view of a container assembly in accordance with one embodiment of the present invention, illustrating the membrane of the overcap being removed to expose the product within the storage compartment;

**FIG. 2** is a schematic, cross-sectional view of the container assembly of **FIG. 1**, showing the product stored within the storage compartment;

**FIG. 3** is a perspective view of a container assembly in accordance with a second embodiment of the present invention, illustrating the membrane of the overcap being removed to expose the product within the storage compartment; and

**FIG. 4** is a schematic, cross-sectional view of the container assembly of **FIG. 3**, showing the product stored within the storage compartment.

#### DETAILED DESCRIPTION OF THE INVENTION

The present invention now will be described more fully hereinafter with reference to the accompanying drawings, in which some, but not all embodiments of the invention are shown. Indeed, the invention may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will satisfy applicable legal requirements. Like numbers refer to like elements throughout.

With reference to **FIGS. 1** and **2**, a container assembly **10** in accordance with one embodiment of the invention is illustrated. The container assembly **10** of **FIG. 1** includes a lid or overcap **12** and a container **14** that defines a cup. Further embodiments of the present invention may comprise alternative containers. The container **14** is structured to

hold a liquid, in particular a hot liquid, which can be inserted into the container and removed from the container, through a top opening 16. The container 14 of FIG. 1 is a tapered cup of a paper, plastic, or expanded polystyrene material, to list three non-limiting examples. The container 14 includes a bottom wall 18 and a generally tubular side wall 20 that is integrally formed with and upstanding from the bottom wall and terminates at a top edge 22. As shown, the side wall 20 may taper such that the diameter is larger at the opening 16 than at the bottom wall 18. The top edge 22 encircles and defines the opening 16 of the container 14. The top edge 22 can also include a bead that projects radially outward from the top edge of the side wall 20 to provide an improved surface for securing the overcap 12 to the container 14. The illustrated overcap 12 and container 14 are generally circular, but the present invention may also include container assemblies 10 of any geometric shape or relative size. In addition, the container 14 may be a container for holding non-liquid products.

The overcap 12 has a top wall 24 that is configured to extend over the opening 16 of the container 14 when the overcap is secured thereon. The top wall 24 defines a recessed storage compartment 26 in an underside of the top wall. The storage compartment 26 is configured to receive a product 28 that is kept in the storage compartment by a removably attached membrane 30. The membrane 30 is removable, as indicated by the arrow in FIG. 1, to provide access to the product 28, preferably when the product is to be mixed with a hot liquid in the container 14. The membrane 30 can be completely removed from the overcap 12 by the consumer when the consumer removes the product 28; however, the membrane can also remain attached to the overcap after removal of the product 28. The membrane 30 is initially attached to the underside of the top wall 24 during the manufacture of the container assembly 10 after the product 28 has been placed in the storage compartment 26.

The membrane 30 of the illustrated embodiment is constructed of a membranous material that is relatively impermeable to moisture. Examples of such membranous material include, but are not limited to metal foil, polyethylene terephthalate, metallized polyethylene terephthalate, polyethylene naphthalate, metallized polypropylene, metal oxide and silicate coated polyester, metal oxide and silicate coated polypropylene, ethylene vinyl alcohol copolymer, and mixtures thereof. The membrane 30 preferably

prevents the ingress of moisture and the egress of the product 28 while the membrane is fully attached to the underside of the top wall 24.

The top wall 24 further includes an annular portion 32 surrounding the storage compartment 26. The annular portion 32 of FIG. 1 is a substantially horizontal surface that defines a drinking aperture 34. The aperture 34 provides access to a liquid in the container 14, which may be a hot liquid into which the stored product 28 is mixed, such that a consumer can drink the liquid without removing the overcap 12. The aperture 34 of FIG. 1 includes two parallel walls joined by two arcuate walls; however, apertures of further embodiments of the invention may have any geometric pattern or may be of any size relative to the annular portion 32.

Surrounding the annular portion 32 is a rim 36, as illustrated in FIG. 2. The rim 36 defines a recess 38 that is sized to engage the top edge 22 of the side wall 20 of the container 14. The engagement of the recess 38 and the top edge 22 holds the top wall 24 of the overcap 12 in position over the opening 16. The recess 38 defines a channel within the rim 36 that preferably provides an interference fit with the top edge 22, by virtue of the width of the recess being less than the thickness of the top edge when the overcap 12 is in an undeformed free state. The recess 38 preferably engages the top edge 22 along the entire circumference of the top edge to also provide a sealed interface to prevent the product, which is typically a liquid, from passing between the overcap 12 and the top edge 22.

Extending downwardly from the rim 36 is the skirt 40, as shown in FIG. 2. The skirt 40 is attached to the rim 36 and encircles a top portion 42 of the container 14. The top portion 42 of the container 14 is the portion of the side wall 20 opposite the bottom wall 18 and includes the top edge 22. In other words, the top portion 42 is the side wall 20 immediately below the top edge 22. The skirt 40 may extend perpendicular to the substantially horizontal annular portion, or the skirt may extend generally parallel to the top portion 42 of the container. In addition, the skirt 40 can flare outwardly, as in FIG. 2. The skirt 40 preferably extends downwardly below a lowermost surface of the top wall 24. As illustrated in FIG. 2, the lowermost surface of the top wall 24 is the surface to which the membrane 30 is attached.

The skirt **40** defines a grip surface **44**, which a consumer may grasp to hold the container assembly **10** and which may insulate the consumer against heat if a hot liquid is held in the container **14**. The grip surface **44** may be of any axial length that is sufficient to allow a customer to hold the container assembly **10** with or without touching the remainder of the overcap **12** or container **14**. The overcap **12** of **FIG. 1** has a grip surface **44** of at least approximately 0.5 inch in length, though the grip surface is preferably at least 1 inch in length and still more preferably is 2 inches in length, as illustrated in **FIGS. 3** and **4**.

A second embodiment of the container assembly **110** is illustrated in **FIGS. 3** and **4**, wherein the overcap **112** includes a skirt **140** that provides a grip surface **144**. The grip surface **144** extends downwardly from the rim **136** of the overcap **112** and is intended to be a surface a consumer can grasp to hold the container assembly **110** when the liquid in the container is hot. The container **114** includes a bottom wall **118** and a side wall **120** upstanding from the bottom wall and terminating at a top edge **122**. The top edge **122** encircles and defines a top opening **116** of the container **114**, and the top edge can also include a bead that projects radially outward from the top edge.

The overcap **112** of **FIGS. 3** and **4** has a top wall **124** configured to extend over the opening **116** of the container **114** when the overcap is secured thereon. The top wall **124** defines a recessed storage compartment **126** on an underside of the top wall. The storage compartment **126** is configured to receive a product **128** that is sealed in the storage compartment by a membrane **130**. The membrane **130** is removable, as indicated by the arrow in **FIG. 3**, to provide access to the product **128**. The membrane **130** is removably attached to a surface on the underside of the top wall **124** during the manufacture of the container assembly **110**. The membrane **130** is also relatively impermeable to moisture.

The top wall **124** further includes an annular portion **132** surrounding the storage compartment **126**. The annular portion **132** of **FIG. 3** is a substantially horizontal surface that defines a drinking aperture **134**. The aperture **134** provides access to a liquid in the container **114** and can have any geometric pattern or be of any size relative to the annular portion **132**. Surrounding the annular portion **132** is a rim **136**, as illustrated in **FIG. 4**. The rim **136** defines a recess **138** that is sized to engage the top edge **122** of the side wall

120 of the container 114 to hold the overcap 112 in position over the opening 116. The recess 138 preferably provides an interference fit with the top edge 122 and preferably engages the top edge along the entire circumference of the top edge to provide a sealed interface.

5 Extending downwardly from the rim 136 is the skirt 140, as shown in FIG. 4. The skirt 140 is attached to the rim 136 and encircles a top portion 142 of the container 114. The top portion 142 of the container 114 is immediately below the top edge 122. The skirt 140 includes a grip surface 144, which a consumer may grasp to hold the container assembly 110. The grip surface 144 is preferably 2 inches in axial length in the  
10 embodiment illustrated in FIG. 4. The skirt 140 also extends downwardly below a lowermost surface of the top wall 124, which is the surface to which the membrane 130 is attached, similar to the embodiment of FIG. 2.

The skirt 140 of FIG. 3 also includes a plurality of spacers 146 on an inner surface 148 of the skirt. The spacers 146 are circumferentially spaced apart from each  
15 other and extend downwardly from the rim 136 of the overcap 112 to an end of the skirt 140 opposite the rim. The spacers 146 can improve the engagement between the overcap 112 and the container 114 if the spacers are sized to create an interference fit with the side wall 120 of the container, as illustrated in FIG. 4. The spacers 146 project radially inwardly from the inner surface 148 of the skirt 140 and radially space the skirt from the  
20 container side wall 120 to insulate against the heat of a hot liquid in the container 114 by providing a continuous pocket, or individual pockets, of air between the side wall 120 and the skirt 140 that reduce the thermal transfer to the skirt. Therefore, the skirt 140 of FIGS. 3 and 4 provides a grip surface 144 that a consumer can grasp to hold the container assembly 110 and to insulate the consumer's hand when the liquid in the  
25 container 114 is hot.

The storage compartment 26 and 126 of FIGS. 2 and 4, respectively, is a frustoconical chamber that includes a flat top surface. This domed portion of the top wall 24 and 124 defines the storage compartment 26 and 126, respectively. Further  
30 embodiments of the present invention include storage compartments of any shape, a non-limiting example being hemispherical. In addition, the storage compartment 26 and 126 of additional embodiments also include a desiccant to absorb moisture so that the

product, which is preferably a powder, is exposed to a minimal amount of moisture. The desiccant can be joined to the inside surface of the storage compartment 26 and 126 or can be incorporated as a layer of the membrane 30 and 130. Non-limiting examples of desiccant material include sodium phosphate di-basic, calcium oxide, sucrose, gelatin, bentonite clay, and silica gel.

The annular portion 32 and 132 of FIGS. 2 and 4, respectively, define a stacking surface upon which another container 14 and 114 can be stacked so that the top container is firmly supported by the overcap 12 or 112 of the bottom container. The bottom wall 18 and 118 of the container 14 and 114, respectively, defines a recess structured and arranged to receive the top wall 24 and 124 of the compartment 26 and 126 of the overcap 12 and 112. Advantageously, the recess of the bottom wall 18 and 118 prevents lateral sliding of the stacked container relative to the bottom container. Further embodiments of the overcap 12 and 112 may define an edge of the rim 36 and 136 that engages the bottom of the side wall 20 or 120 to prevent lateral sliding of the stacked container relative to the bottom container. Still further embodiments of the present invention may comprise alternative stacking surfaces or features for secure stacking of a top container onto the overcap of a bottom container.

To manufacture the container assembly 10 of the present invention, the container 14 and the overcap 12 are individually formed. Preferably, the overcap 12 is thermoformed, injected molded, or blow molded from a polymer material. The overcap 12 may be formed to include a multi-layer polymer structure to provide oxygen and moisture barrier should the packaged product require such a barrier. After the overcap 12 hardens, the product 28 can be inserted into the storage compartment 26 and the membrane 30 attached to the underside of the top wall 24. The membrane 30 is attached to the overcap 12 by any suitable process, which include conductive heat sealing, ultrasonic sealing, the applying of adhesives, or any other joining method. Once the product 28 is securely stored in the storage compartment 26, the overcap 12 can be paired with the container 14 to complete the container assembly 10.

Many modifications and other embodiments of the invention set forth herein will come to mind to one skilled in the art to which the invention pertains having the benefit of the teachings presented in the foregoing descriptions and the associated drawings.



Therefore, it is to be understood that the invention is not to be limited to the specific embodiments disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for purposes of  
5 limitation.